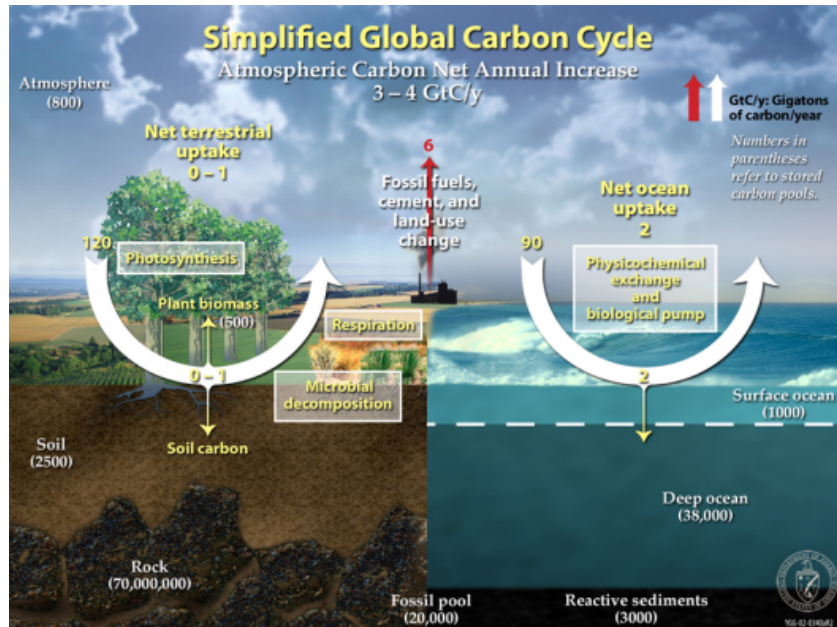


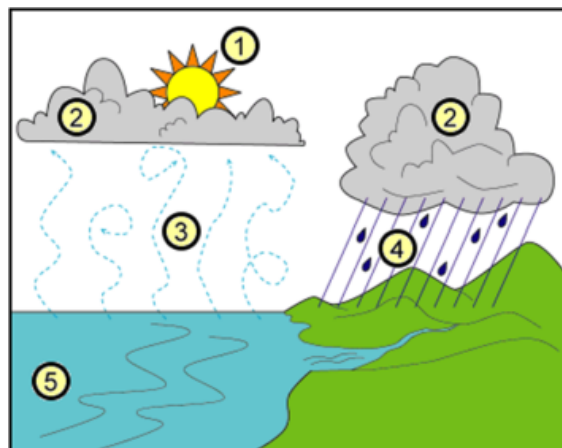
# Cycles of Matter

Unlike the one-way flow of energy, matter is recycled within ecosystems.

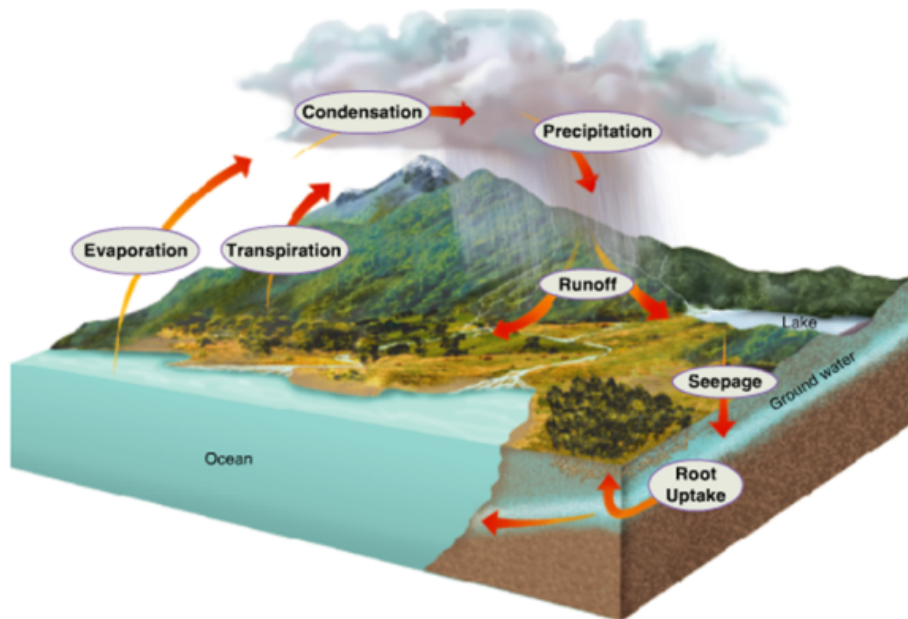


# Water Cycle

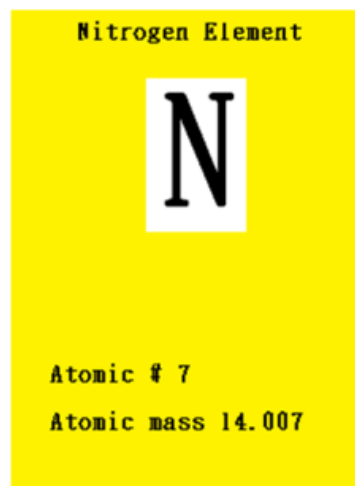
1. Evaporation
2. Condensation
3. Precipitation
4. Infiltration
5. Runoff



## The Water Cycle

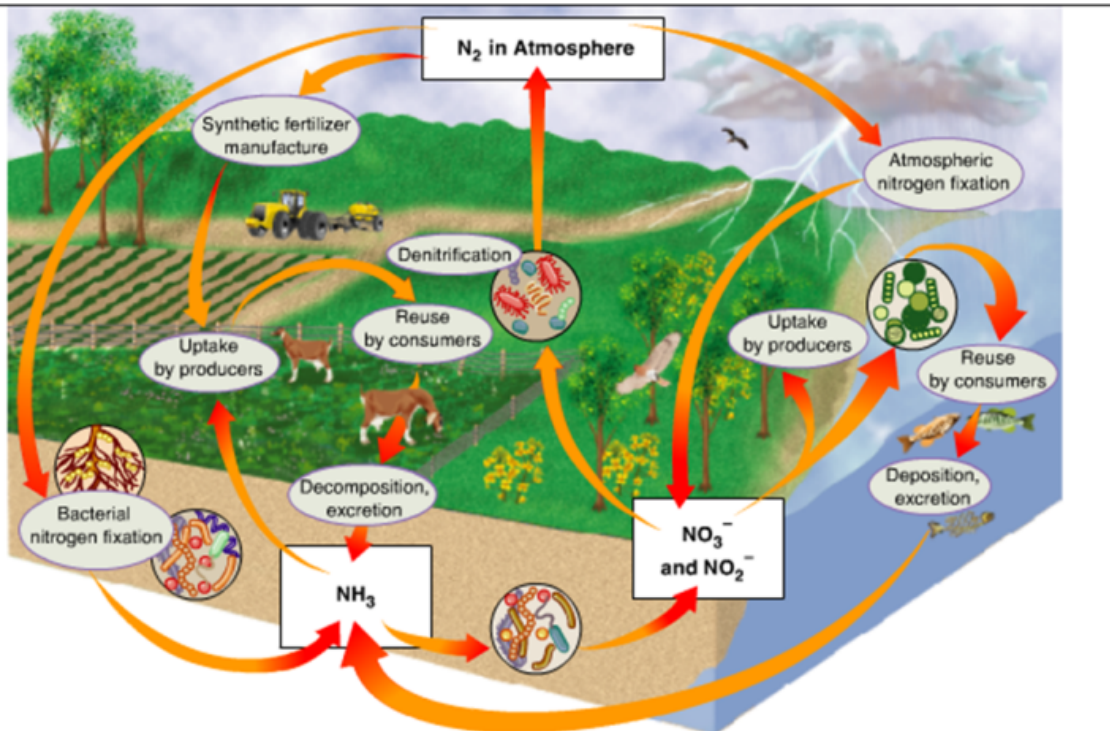


## Nitrogen Cycle



Nitrogen is present in all living organisms, in proteins, nucleic acids, and other molecules

# The Nitrogen Cycle

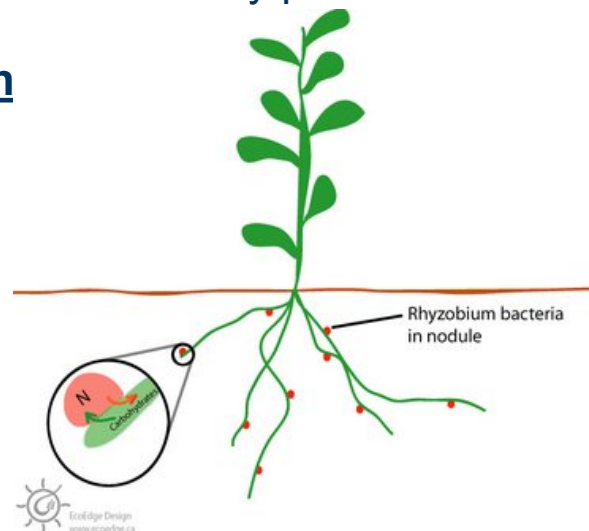
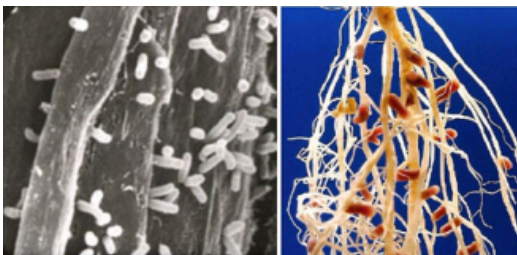


**78% of the atmosphere is  $N_2$  gas**

*Most living organisms  
can NOT use nitrogen in this form.*

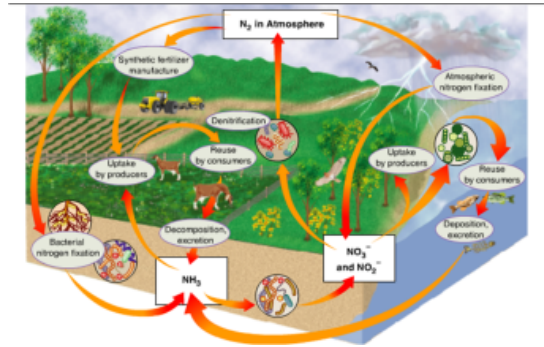


- Some bacteria (soil bacteria) **CAN** convert  $N_2$  into ammonia which can be used by plants.
- This is called **nitrogen fixation**



When organisms die, decomposers return nitrogen to the soil as ammonia. The ammonia may be taken up again by producers.

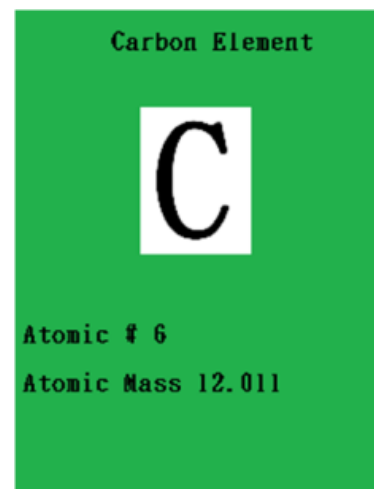
Other soil bacteria convert nitrates back into nitrogen gas ( $N_2$ ) in a process called **denitrification**.



## The Carbon Cycle

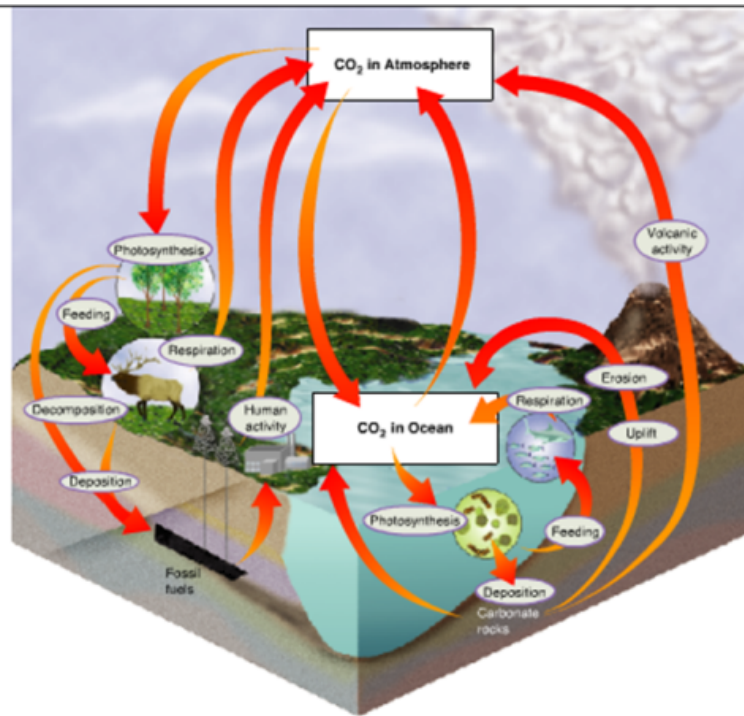
Carbon is the 4<sup>th</sup> most abundant element in the universe and the 2<sup>nd</sup> most abundant in the human body.

It is present in all known life forms, making it the chemical basis for all life.



# The Carbon Cycle

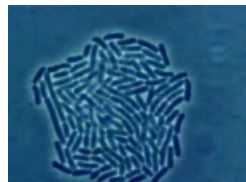
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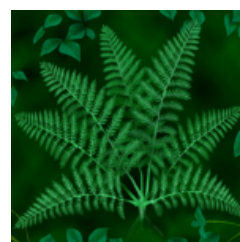
Carbon exists in the atmosphere  
as carbon dioxide gas (CO<sub>2</sub>)



Respiration, and decomposition  
of plants and animals **ADD** carbon dioxide  
to the air and remove oxygen.



Photosynthesis **REMOVES** carbon dioxide and adds oxygen.



## Review Questions

1. What form of carbon is found in the atmosphere?
2. How does carbon from the atmosphere enter the biotic part of an ecosystem?
3. What type of organisms are able convert nitrogen from the atmosphere into a form that plants can use?
4. What type of organisms are involved in putting nitrogen back into the atmosphere?
5. What is the above process called?